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ZOOLOGY.

The Cestodes of Herbivorous Animals.[1]—Dr. C. W. Stiles and Albert Hassall have issued a well illustrated list of the adult tape worms of cattle, sheep and allied animals. In this work the authors have had the great assistance to be derived from studying many of the original types. From this paper we learn that the domestic cattle are infested by 8 adult cestodes, the goat by 2, the sheep by 11, etc. The new species described are *Monezia oblongiceps* from a South American Coassus, *M. trigonophora* from sheep, and *M. planissima* from sheep and cattle. In connection with each species is a good anatomical description.

Cladoceran Crustacea.[2]—Prof. E. A. Brige, in the third of his "Notes on Cladocera," enumerates 63 species of Cladocera as having been found in Wisconsin and Northern Michigan. A table is given showing the distribution of each species in the lakes explored, and four plates illustrate the new or little known forms enumerated. The new species are *Moina affinis*, *Ceriodophina lacustris*, *Daphinia breviceps*, *Bunops* (n. g. for *Macrothrix serricaudata* Daday and *B. scutifrons* nov.) *Chydorus faviformis*, *Anchistropis minor*. A most interesting comparison is made between the Cladoceran fauna of Wisconsin and various regions of Europe.

Eyes of the Harvestmen.—Dr. Frederick Purcell has just issued an account of the eyes of the Phalangids[3] which is rather difficult to understand, on account of the absence of all illustrations. The Phalangids have two eyes which Purcell homologizes, without a doubt, with the median eyes of the scorpions. Like them, they are developed from three layers, the middle forming the inverted retina. The retinulæ each consist of five cells arranged in a circle and each retinular cell gives rise to a rhabdomere so that the rhabdom is five-parted and the longitudinal grooves on the outer surface of each rhabdomere give it a star-like section. The retinal cells are pigmented distally, the nucleus and nerve termination are in the proximal portions. Besides these there are club-shaped pigment cells in the distal retinular region. The principal differences between these eyes and the middle eyes of the scorpion lie in the absence of a central cell, in the anatomy of the retinulæ and in the absence of inter-retinular pigment cells from the Phalangids. As a summary Purcell says: "The anterior middle eyes of the spiders, the eyes of Phalangids and the middle eyes of the scorpions, as well as the middle eyes of Limulus, represent a series of homologous structures, which are characterized by an inverted retina with retinulæ or at least rhabdomes."

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[1] U. S. Dept. Agric., Bureau of Annual Industry, Bulletin, 4, 1893.

[2] Trans. Wisc. Acad. Sci. Arts, IX, 1893.

[3] Ueber den Bau der Phalangiden Augen; Dissertation. Berlin, 1894.

Range of Placostylus.—A study of the geographical distribution of the land molluscan Placostylus, by Mr. C. Hedley, leads to some interesting conclusions. According to that author, Wallace's theory of a land connection between Australia and New Zealand is untenable. Mr. Hedley's theory is that the various islands where Placostylus is found, embracing the archipelagoes of Solomon, Fiji, New Hebrides, Loyalty, New Caledonia, Lord Howe and New Zealand, are the remnant of a continental area to which he gives the name, Melanesian plateau. This plateau was never connected with nor populated from Australia; its fauna was probably derived from Papua via New Britian. New Zealand and New Caledonia were early separated from the northern archipelagoes, while the Fijis remained to a later date in communication with the Solomons, but were severed from that group before the latter had acquired from Papua much of its present fauna.

The author calls attention to the fact that not the depth but the permanence of the ocean is the real limit to the distribution of the forms of life. (Proceeds. Linn. Soc. N. S. W., 1892).

The Scales of Lepidosteus.[4]—Mr. W. S. Nickerson finds that in *Lepidosteus* the dermal scleroblasts give rise to three different products: (1) calcareous scale material, (2) ganoine, and (3) a ganoine membrane. There is no differentiation of the cells, but rather a modification of the function of the same cells at different periods of their history. The ganoine has been called the enamel layer, but it is not enamel, as its development and chemical reactions show. It is secreted on the outer surface of the scale by cells of dermal origin, not by epidermal cells, as is the case with true enamel. The epidermal cells over it are unmodified and separated from the scale by a dermal layer of cells. Such a condition is found no where else among vertebrates.

During the development of the scale, spines tipped with an enamel layer are formed, but disappear before the maturity of the scale. Their number and irregularity of distribution over the scale opposes

[4] Bull. Mus. Comp. Zool., XXIV, No. 5 (1893).

the supposition that the ganoid scale is a number of placoid scales used together. There can be no homology between them except in their both being dermal structures. In the Selachians the basal plate originated in connection with the formation of spines, but in the Lepidosteus the spines have degenerated while the basal plate has developed independently at the same time sinking deeper in the dermis.

In the Telosts there is no ganoine, but a modification of the dermis takes place similar to that in *Lepidosteus.* The same sinking or a tendency to reduction of superficial parts and increase of the deeper parts, involving the reduction of spines. In the lower Teleosts the spines are connected with the scale by connection tissue only, thus showing a more degenerate condition than in Lepidosteus.

It appears, then, that the Lepidosteus and Teleost scales have been derived from the placoid scale along independent lines.—F. C. KENYAN.

Mammalia of Mt. Pocono.—Considering the fact that hitherto no systematic collecting of small mammals has been attempted in the Pennsylvania mountain districts the following notes may seem worthy of record. During the latter part of June and first week of July, 1893, in company with Mr. Witmer Stone, I spent about ten days collecting birds and mammals in the vicinity of Mt. Pocono, Monroe Co., Penna. The general situation and elevation of the locality warranted a much more northern fauna than that found in the southeastern part of the state, and it is hence not at all surprising that such boreal forms as *Zapus insignis, Evotomys gapperi* and *Tamias striatus lysteri* were obtained. None of these, so far as I am aware, have been previously recorded from Pennsylvania.

A list of the mammals collected is as follows:

Blarina brevicauda.—This shrew was the most abundant of any species noted; the specimens secured forming over 30 per cent of the whole number collected. I found them, as Dr. Merriam has said, moving about during the day, and on my afternoon visit to the traps rarely failed to secure one or more. Several were taken in the same runs with *E. gapperi.*

Sorex platyrhinus (Dobson).—Two specimens of a small shrew were secured which Mr. G. S. Miller, Jr. has kindly referred for me to this species, using the name as a provisional designation. A third specimen, badly decomposed, was found in the middle of a road through the woods. Of this the skull only was preserved.

Evotomys gapperi.—Five specimens of the red-backed mouse were secured, of which four were taken in decayed stumps, and the fifth in a runway under a log.

Sitomys americanus.—A young male and female in plumbeous gray pelage, with a narrow streak of brown on the flanks were the only ones collected.

Arvicola pinetorum.—Two specimens were secured under a log.

Zapus insignis.—An adult male of this handsome mouse was secured July 4th, on the bank of a stream in a ravine covered with a growth of hemlocks and laurels.

Tamias striatus lysteri.—We found this chipmunk quite common among the rocks and young growths where the timber had been recently destroyed by fire. The specimens collected, on comparing them with skins from Maine, were found to be typical *lysteri.*

Sciurus hudsonius.—A tolerably common species. A suckling female, shot on June 29th, is an interesting specimen as showing a peculiar phase of the molt. The long winter coat is considerably bleached on the upper parts and sides; and from the nose to a line drawn across the head just back of the ears, npon the anterior margin and extreme tip of the ears, and for a space upon each shoulder it is entirely replaced by the new growth of shorter yellowish rusty hairs annulated with black. The bright chestnut of the dorsal region, besides being very much worn, is interrupted just behind the shoulders, by an irregular patch of the new hair, in which the black predominates. The sides of the head and neck as far forward as the roots of the whiskers, the greater surface of the ears, a space on the back of the head, and the entire posterior portion of the body still retain the old pelage.—WM. A. SHRYOCK.

The Mammals of Thibet.—Several French travellers have explored China, Mongolia, Thibet and Indo-China, and their reports are full of interest. Every naturalist knows of the brilliant discoveries made 25 years ago by M. l'abbé Armand David; they were revalations of the richness of the Thibetan fauna. Since that time M. le Dr. Harmand, M. Pavie, M. Joseph Martin, le prince Henri d'Orleans and M. G. Bouvalot, M. Dutreuil de Rhins and the French missionaries of Tatsi-en-lou, directed by M-go Biet, have contributed much to our knowledge of the natural products of central and eastern Asia.

The collections made by le prince Henri d'Orleans have been referred to the Museum d'histoire naturelle. They comprise a large number of mammals and birds, the former of which forms the basis of a paper by M. Milne-Edwards. The birds have been studied by M. le Dr Oustalet.

The fauna of Turkestan is very distinct from that of the Thibet region. The Tian-Chan mountains of Chinese Turkestan are inhabited by large quadrupeds very different from those of Europe; they are wolves bears, deer (*Cervus xanthopygus* A. M.-Ed.), roebucks (*Cervus pygargus*). Tigers and panthers from the south of Asia are seen there frequently. In the sterile and sandy desert which extends from Korla to Lob-Nor the fauna offers different characteristics; gazelles are abundant there (*Gazella subgutturosa*). They are seen in small troupes in the middle of those plains covered with a scanty herbage, and Tamarisks, where the only trees are stunted and twisted poplars, and where the river Tarim is lost in a great swamp. The color of the skin of these quadrupeds harmonizes admirably with that of the sand. The foxes are light yellow (*Vulpes flavescens* Blan.); *Gerbillus psammophilus* is common and resembles that of the Sahara; a cat (*Felis shaviana*) resembles in color and markings *Felis margaritœ* of the deserts of the northern part of Africa. Wild camels are found in small herds.

On climbing the slopes of the Al-tyn-Tagh, other animals are found; *Ovis poli*, *Pseudovis burrhel*, *Pantholops hodgsonii*, *Gazella picticauda*, wild Yaks with large diverging horns, covered with dark brown hair, *Equus kiang*, and numerous rodents.

From the Tengri-Nor to Batang the fauna is stilll more varied. The mountains, covered with conifer forests and thickets of rhododendron, afford shelter to many mammals. Travellers report seeing a black monkey with a long tail, which, however, they could not get near; but they captured several rhesus Macaques, remarkable for their large size, their long thick fur, and short tails. These animals, when adult, are comparable in size to the large Cynocephali of Africa; they live in large troops, are seen even in the midst of snow, and hide themselves among the rocks. The natives treat them respectfully and often feed them. A young female, bought in May, 1890, at Kiam Tatie, was sent to Paris, and is now in the menagerie of the museum. Although kept in a warm room, it has not the thick long fur to which it owes its specific name of *Macacus vestitus*. Neither *M. thibetanus* nor the snub-nosed monkey, *Rhinopithecus roxellanœ*, have been seen from Batang to Tsienlou.

Panthers and Ounces are abundant, also *Lynx rufus*; *Felis scripta* is also found here, and another species with a large body, belonging to the same group as *F. chaus*, but differing from it, which I have named *F. bieti; F. tristis*, which attains considerably larger dimensions than it is generally accredited with; *F. manul*, remarkable for the black tint on its chest, and belonging to a variety named by Hodgson, *F. nigripectus.* Wolves are common, and Cuons with long reddish brown hair, probably *C. duchunensis;* Foxes, Skunks and Martens (*Putorius davidianus* and *Martes flavigula*) ; large bears, one black with a yellow pectoral spot, the other, brown, shading to bright yellow, identical with the one described by Fr. Cuvier under the name, *Ursus collaris. Arctonyx obscurus* A. M.-Edw. and *Ailurus fulgens. Ailuropus melanoleucus* is unknown in this region.

The Glires are represented by *Pteromys alborufus*, numerous squirrels (*Sciurus erythrogaster* and *Sc. fernyi*), *Tamias maclellandi, Arctomys robustus,* different species of Mus, a Siphneus distinct from those already known (*S. tibetanus*), *Lepus hypsibius*, the feet of which are colored red by contact with the ferrugineous soil, two species of Lagomys (*L. koslowi* and *L. melanostomus* Büchner).

The ruminant species are numerous. Wild Yaks, *Ovis nahoura*, and a species with compressed horns, believed to be new; *Pantholops hodgsonii*, a large Nemorhedus with a body like *N. bubalinus* of India, but having a long mane of white hair, and related to the species *Nemorrhedus argyrobhœtus,* described by Père Hendes; two varieties of musk, Moschus, one gray-black in color, the other lighter, inclining toward yellow; *Elaphodus cephalophus,* the same species as that found in the valley of Moupin, but not quite so red; a roebuck similar to the one in the mountains Thian-Chan, but not so robust (*Capreolus pygargus*) ; a deer belonging to the group Rusa, but differing from the Sambur of India and Cochin China by its bushy tail which is longer and blacker, by larger ears, its muzzle bordered with black and its feet which are yellowish-white at their extremities.

It is astonishing that in such a short time the explorers could have collected such a large number of species. It is evident that fresh research in the same field will bring to light other mammals. Mgr. Biet, Bishop of Diana, and apostolic missionary of Thibet, has kindly given orders to have hunters sent in search of the animals along the upper Yang-tse-Kiang; but with these at hand, we see the resemblance between the animals of this part of Thibet and those of Indo-China, and we also note, at the same time, certain peculiar characters which are not found elsewhere. (Prof. A. Milne-Edwards in Proceeds. Cong. Internatl. de Zool, Deuxième Session à Moscow, 1892. Moscow, 1893.)

Zoological News.—ARACHNIDA.—In two papers,[5] Mr. George H. Carpenter enumerates five species of Pycnogonids brought back by

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[5] Sci. Proceed. Roy. Dublin Socy., VII, 1892: VIII, 1893.

Prof. A. C. Haddon from Torres Straits. Of these, three (*Parapellene haddonii*, *Ascorhynchus tenuirostris* and *Rhopalorhynchus clavipes*) are new.

HEXAPODA.—The last number of the Kansas University Quarterly (Vol. II, No. 3, 1894) contains "New genera and species of Dolichopodidæ," by J. M. Aldrich, and "Descriptions of North American Trypetidæ," by W. A. Snow.

MOLLUSCA.—The molluscs collected during the United States Expedition to West Africa, in 1889–90, have been made the subject of a report by Mr. R. E. C. Stearns. In all there are 122 species, birds-it uted as follows: Pelecypods, 35; Marine Gasteropods, 69; Land Gasteropods, 82; Cephalopods, 5. (Proceeds. U. S. Natl. Mus. Vol. V, 1893.)

CHORDATA.—Balanoglossus has recently been found at Broken Bay and at Jervis Bay, New South Wales. The genus was previously unknown from Australia.

Prof. W. E. Ritter describes[6] a new Tornaria from California, the first indication of the existence of Balanoglossus on the Pacific coast of the United States. This Tornaria, like the Bahaman form, possesses tentacles on the longitudinai ciliated bands, and like the form described by Metschnikoff has a second circular band of cilia. In the oldest Balanoglossus obtained by the transformation of the Tornariæ, but two pairs of gill slits had appeared, and there is farther a thickened œsophageal band of epithelium which Professor Ritter would compare, in function at least, with the endostyle of Tunicates and Leptocardii. Lastly, the nerve cord does not arise by delamination but by a sinking down of the whole ectodermal nerve layer in a manner somewhat like that in Amphioxus. In the stages studied there was no trace of neuropore or neural canal.

An important collection of fresh water fishes from Borneo, examined by M. Leon Vaillant, extends the number of species now known from that Island to 322. M. Vaillant points out the strong resemblance of the fish fauna of Borneo to that of Indo-Malaysia. (Revue Sci., Feb., 1894.)

According to Mr. F. C. Test, the "Gopher Frog," *Rana aesopus* Cope, is subterranean in its habits, living in the burrows of the Gopher Turtle. It probably feeds on the insects living in the burrows, for these holes possess a flourishing insect fauna, to a great extent peculiar to them. (Science, 1893.)

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[6] Zool. Anzeiger XVIII, 24, 4894.